

1 1. A system for automatically producing an
2 embroidery design, the system comprising:

3 a) means for inputting an embroidery pattern
4 into an image data file, the image data file
5 comprising a plurality of pixels, each pixel
6 comprising a bitmap representing a color;

7 b) processing means operatively connected to
8 said inputting means for storing said image
9 data file; and

10 c) an embroidery data generating mechanism
11 operatively connected to said processing
12 means for generating a complex embroidery
13 pattern directly from a scanned, color image.

1 3. The system of claim 1, further comprising
 2 line-fitting means for line-fitting each object,
 3 wherein an object comprises an outer contour, a
 4 predetermined number of inner contours, and a skeleton
 5 contour, said line-fitting means comprising a gallus-
 6 neurath triangular filter.

1 4. The system of claim 3 further comprising
 2 stitch angle determination means for determining a
 3 stitch angle that produces a minimal plurality of
 4 fragments.

1 5. The system of claim 4, further comprising
 2 generate path means for determining an optimal order
 3 for the plurality of fragments to be sewn.

1 6. The system of claim 1, further comprising
 2 labelling means for labelling a plurality of points on
 3 the skeleton and edge contours.

1 7. The system of claim 6, further comprising
 2 merging means for merging a series of points from the
 3 plurality of points on the skeleton contour.

1 12. A method for automatically producing an
2 embroidery design, the method comprising the steps of:

3 a) inputting an embroidery pattern into an image
4 data file, the image data file comprising a
5 plurality of pixels, each pixel comprising a
6 bitmap representing a color;

7 b) classifying and line-fitting each object in
8 said bitmap as a thin object or a thick
9 object, each of said objects comprising an
10 outer contour, any number of inner contours,
11 and a skeleton contour;

12 c) computing an optimum sew order; and

13 d) generating an image output file.

1 13. The method of claim 12, further comprising
2 the step of generating the plurality of fragments.

1 14. The method of claim 13, further comprising
2 the step of determining an optimal order for the
3 plurality of fragments to be sewn.

1 15. The method of claim 14, further comprising
 2 the step of merging a series of points from the
 3 plurality of points on the skeleton contour.

1 16. The method of claim 15, further comprising
 2 the step of extracting at least one column.

1 17. The method of claim 16, wherein said step (b)
 2 of classifying each pixel within the image data file
 3 comprises the step of associating each connected pixel
 4 having a similar color with a unique object identity.

1 18. The method of claim 17, wherein said step (b)
 2 of classifying additionally comprises the step of
 3 traversing a plurality of chain codes associated with
 4 one of the group of skeleton contour, inner contour(s),
 5 and outer contour.

1 19. The method of claim 14, wherein said step of
 2 determining an optimal order for the plurality of
 3 fragments to be sewn comprises the step of identifying
 4 a point and recursively identifying a plurality of
 5 fragments touching said point.

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- 1 20. A method for automatically producing an
- 1 embroidery design, the method comprising the steps of:

- 2 a) inputting an embroidery pattern into an image
- 3 data file, the image data file comprising a
- 4 plurality of pixels, each pixel comprising a
- 5 bitmap representing a color;

- 6 b) locating a set of regular and singular
- 7 regions disposed in said image data file;

- 8 c) interpreting said set of regular and singular
- 9 regions;

- 10 d) computing an optimum sew order; and

- 11 e) generating an image output file dependent on
- 12 said interpreted set of regular and singular
- 13 regions.